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The Effect of Different Patterns of Upper, Lower and Whole Body Resistance Exercise Training on Systemic and Vascular Inflammatory Factors in Healthy Untrained Women

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Abstract : Inflammation by various mechanisms may cause atherosclerosis. Systemic circulating inflammatory markers such as C-reactive protein (CRP), pro-inflammatory cytokines such as Interleukin-6 (IL-6), vascular inflammatory markers as adhesion molecules like Intracellular Adhesion Molecule-1 (ICAM-1) and Vascular Cell Adhesion Molecule-1 (VCAM-1) are the predictors of cardiovascular diseases. Regarding the conflicting results about the effect of different patterns of resistance exercise training on these inflammatory markers, present study aimed to examine the effect of different patterns of eight week resistance exercise training on CRP, IL-6, ICAM-1 and VCAM-1 levels in healthy untrained women. 56 healthy volunteered untrained female university students (aged: 21 ± 3 yr., Body Mass Index: 21.5 ± 3.5 kg/m²) were selected purposefully and divided into four groups. At the end of training protocol and after subject drop during the protocol, upper body exercise training (n=11), lower body (n=12) and whole body resistance exercise training group (n=11) completed the eight weeks of training period although the control group (n=7) did anything. Blood samples gathered pre and post-experimental period and CRP, IL-6, ICAM-1 and VCAM-1 levels were evaluated using special laboratory kits, then the difference of pre and post values of each indices analyzed using one-way analysis of variance ($\alpha < 0.05$). The results of one way ANOVA for difference of pre and post values of CRP, ICAM-1 and VCAM-1 showed no significant changes due to the exercise training, but there were significant differences between groups about IL-6. Tukey post- hoc test indicated that there is significant difference between the differences of pre and post values of IL-6 between lower body exercise training group and control group, and eight weeks of lower body exercise training lead to significant changes in IL-6 values. There were no changes in anthropometric indices. The findings show that the different patterns of upper, lower and whole body exercise training by involving the different amounts of muscles altered the IL-6 values in lower body exercise training group probably because of engaging the bigger amount of muscles, but showed any significant changes about CRP, ICAM-1 and VCAM-1 probably due to intensity and duration of exercise or the lower levels of these markers at baseline of healthy people.

Keywords : resistance training, C-reactive protein, interleukin-6, intracellular adhesion molecule-1, vascular cell adhesion molecule-1
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